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THE FEEDING OF INFANTS AND YOUNG CHILDREN

By Alice Haehnlen, R.N.
New York, N. Y.

Years ago, when many of us were in training, we were taught that the component parts of food were called fats, proteins, and carbohydrates, and we had a hazy idea that this classification covered the whole matter. A few maintained that there were "salts" found in fruit and whole grain which were necessary for proper nutrition. The exact chemical composition of the so-called salts was and is still unknown.

Within the last few years we are indebted to Casimir Funk and his co-workers for the isolation of a substance from these salts, which has been termed "vitamine." This vitamine has a peculiar and important function in aiding the proper metabolism of fats and carbohydrates. When present in the food given, the vitamine shows its effect by the health-giving tonic glow in the skin, proving that a certain amount of stimulation is caused thereby. On the other hand, the absence of the vitamine is equally remarkable by the paleness and anemia usually present in the series of cases which, for the want of a better name, have been called deficiency disease.

The mistake most frequently met with in infant feeding is keeping the child too long on a milk diet alone, beyond the time at which other foods should be given. Children fed in this way show signs of pallor, late closure of the fontanel, delay in walking, and general malnutrition. This secondary anemia is explained by the small amount of iron in the salts of cows' milk. For many years drugs were used to supply this deficiency, but with unsatisfactory result.

There is no doubt that under normal conditions mother's milk is the ideal baby's food up to the sixth or seventh month. Unfortunately, however, human milk as well as cows' milk, is frequently deficient in many vital parts. It is necessary to supply these parts to make up the deficiency, or the structure of the infant will suffer. Rickets or scurvy most frequently develop. Usually the first symptoms noted are pallor, constipation, head sweating, and restlessness. Then flabby muscles and soft bones result. This deficiency in the food is also frequently manifested by an eczema or a frequently recurring urticaria. It has been proven by the rapidity with which these symptoms disappear when food containing large quantities of vitamine are given, that this vitamine was lacking in the diet.

Among the foods containing this vitamine, and which are suitable, when properly prepared, for the diet of infants and young children, are: orange, pineapple, spinach, beet tops, chard, and other pot greens, carrots, potatoes, unpolished rice, whole cereals, and egg yolk.

There are, however, other elements in the diet which must be considered and which supply the main substance of nutrition. They are: fat, carbohydrate (sugar and starch), and protein, besides water and certain salts. Not only are all these necessary, but they must be furnished in certain proportions to maintain health.

Fats.—The fats include animal and vegetable fats. Animal fats have been proven superior to vegetable fats as food. Those suitable for the young child include: cream, butter, bacon, codliver oil, olive oil, and peanut butter. The New York Board of Health recommends oleomargarine as the most economical fat, and adapted to the diet of children.

The Carbohydrates.—The carbohydrates include cereals, vegetables, breadstuffs, sugar and sweets. There are three kinds of sugar used in infant feeding: milk sugar, called lactose; malt sugar, called maltose, and cane sugar, called granulated sugar. When constipation exists, malt sugar or milk sugar should be used. Infants gain rapidly in weight when malt sugar or the malt preparations are given. There are several good malt preparations on the market: in powder form, the Mead's dextri-maltose; or in liquid form, Borchardt's malt soup extract; or the neutral maltose made by the Maltzyme Company of Brooklyn. If infants vomit, maltose should be replaced by either milk or by cane sugar.

Sugar is not only used for sweetening food, but it is a very essential element in the growth of the body. Sugar exists in human milk in a larger quantity than all other elements combined. The healthy infant can digest maltose or malt sugar, 1 teaspoonful to each feeding, or 6 to 7 teaspoonfuls in the daily quantity of food prepared.

The Proteins.—The cheapest and best protein for children is that found in milk,—fresh, raw milk. In boiling milk, the vitamine is destroyed, and the cream or curd is so altered that it induces constipation. There are times, however, when milk procured from unknown dairies cannot be regarded as safe, and under such conditions it must be boiled. Boiled milk should not be fed for any length of time or scurvy will develop, unless fresh fruit juices and fresh vegetable juices are added to the diet.

Water.—Water plays an important part in metabolism. By means of water the food is kept in a state of solution or minute subdivision, thus rendering it more easy of digestion. It carries nutritious material in the blood, lymph cells, etc., and it also carries away the waste products through the kidneys, bowels, lungs, and skin.

According to the majority of pediatrists, the amount of water necessary in twenty-four hours (inclusive of that contained in the milk) is equal to one-sixth of the body weight.

An infant up to the first month should receive several drams of plain filtered water immediately after each feeding, or as soon after feeding as possible. Later, one or two ounces may be given between feedings. If it is not time for feeding, and the infant is restless, a drink of cool water will frequently quiet it.

Water is a most important factor when we desire to modify constipation, especially so when large cheesy curds are found in the stool. Stagnant milk in the mouth, especially in a feverish child, can produce soreness and ulceration. A drink of water after each feeding will cleanse the mouth and prevent this condition.

Fruits.—Fruits, as a rule, are easily digested by young children. For the very young child, stewed fruits (with the exception of orange and pineapple juice) are preferable to raw, because the cellulose or woody fiber is softened during cooking. If covered while cooking, very little of their nutritive value is lost.

Oranges, apples, peaches, grapes, and dried prunes, peaches and apricots are among the suitable fruits. Experiments made by Drs. Marshall Pease and Anton Rose, at the New York Post Graduate Medical School and Hospital, have proven that the banana contains more nourishment than any other fruit and, contrary to the popular belief, it is not indigestible when fully ripe or cooked. Most children of three years can digest bananas perfectly, but a banana is not ripe until black spots appear on the peel. The fruit should be baked, or when eaten raw, should be peeled, then scraped of the fuzzy covering, sliced, and served with milk.

Eggs.—Yolk of hard cooked egg (one-third) in gradually increasing doses may be given as early as the 6th month. Egg-yolk is an important vitamine-containing food often omitted on account of a possible anaphylaxis which some children have against egg albumin. "I have never seen a case of anaphylaxis caused by egg yolk, neither have I seen any cases recorded." (Louis Fischer.)

Egg yolk should be prepared by placing an egg in a pan and covering with boiling water. Do not allow the water to boil after the egg is put in, but keep it hot for 45 minutes. Cooked in this way the yolk will be formed, but mealy and easily powdered, and can be added to the milk.

Vegetables.—The value of vegetables depends not only on their richness in iron and other important salts, but also upon the fat, carbohydrates and proteins they contain, and the amount of fiber which aids proper action of the bowel.

From experiments made with various vegetables at the Babies' Hospital, and at the laboratories of the Rockefeller Institute for Medical Research, New York, it has been found that a large quantity of salts, in an especially suitable form, can be fed to children as young as 6 or 7 months. It has been interesting to learn that infants so fed showed an earlier closing of the fontanel, and a general greater activity than those without the addition of vegetables or vegetable juices to their diet.

Method of Preparing the Vegetables.—"Analysis of the water drained from vegetables cooked in water showed that there was an excessive waste of salts if this water were discarded. Steaming was therefore tried. A rice steamer was used in which the vegetable was held in a tightly covered receptacle with a rather finely perforated bottom. This part fits closely on the top of the boiler which holds the water. This proved to be the most economical method of cooking for preserving the salts."

If a steamer is not available, the cooking may be done in a double boiler. The vegetable should be prepared as usual, drained after washing, and placed with no additional water in the inner boiler. Spinach requires about thirty minutes to cook in this manner. At three months, 1 teaspoonful of the juice squeezed from a vegetable so prepared, may be given; at four months, 2 teaspoonfuls, and at five months, 3 teaspoonfuls. At six months, the pulp, or that which may be forced through a fine sieve can be assimilated. At one year, about 6 teaspoonfuls of the whole mass, finely chopped, may be given; the small pieces of fiber being especially beneficial if constipation exists.

Beginning with the second year, the period of infancy ends, and suckling or bottle feeding should cease. The functions of digestion are now more fully established or developed, and the child is able to digest a variety of semi-solid foods. At this age the child usually has a number of teeth cut through and is able to partly masticate the food.

While some poor children are underfed, the majority are overfed or improperly fed. They eat what they like and when they want it, and thus lay the foundation for digestive troubles. Food should not be given at other than regular meal times. A child's appetite is not always a reliable guide as to the amount of food he needs.